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Understanding Posttraumatic Stress and Academic Achievement: Exploring Attentional Control, Self-Efficacy, and Coping Among College Students

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UNDERSTANDING POSTTRAUMATIC STRESS AND ACADEMIC ACHIEVEMENT: EXPLORING ATTENTIONAL CONTROL, SELF-EFFICACY, AND COPING AMONG COLLEGE STUDENTS

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The present study examined differences in attentional control, attentional control self-efficacy, and coping as self-regulatory mechanisms among students with varying grade point averages (GPA) who experience posttraumatic stress symptoms (PTSS). Subjects included 58 college students from one large comprehensive university in the Mid-South who met the criteria for diagnosis of PTSS based on the Impact of Event Scale-Revised (IES-R). Three groups were created based on college GPA and graduation requirements at the university (at-risk for graduation, on-track for graduation, and on-track for graduating with honors). Participants completed a survey that included demographics and measures of PTSS, attentional control, attentional control self-efficacy, and coping. A one-way between groups ANOVA revealed statistically significant differences in attentional control self-efficacy and avoidant coping between the Honors and At-Risk groups. The current study provides additional information and support that success for students with PTSS may be explained by their confidence in their abilities to control their attention and using less avoidant coping strategies. However, as a group, students with PTSS need strategies for increasing their attentional control, self-efficacy beliefs, and adaptive coping.

Introduction

Research indicates that 45-84% of college students have been exposed to at least one traumatic event in their lifetime (Avant, Swopes, Davis, & Elhai, 2010; Bachrach & Read, 2012; Bernat, Ronfeldt, Calhoun & Arias, 1998; Grasso et al., 2012). Experiencing a traumatic event could result in the development of symptoms related to posttraumatic stress disorder (PTSD). According to the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (*DSM-5*; American Psychiatric Association [APA], 2013), these symptoms include re-experiencing the traumatic event, avoiding trauma-associated stimuli, negative alterations in cognitions and mood, and alterations in arousal and reactivity following the traumatic event. Students with posttraumatic stress symptoms (PTSS) may experience significant cognitive impairment (e.g., difficulty with focusing attention and suffering cognitive overload), which negatively impacts academic performance and school retention (Bachrach & Read, 2012). However, there are some students who are still successful in their academic endeavors even with PTSS (Saigh, Mroueh, & Bremner, 1997). The findings that students with PTSS are still successful in school, albeit scarce, suggest that there are differences among students with PTSS in regards to academic achievement. Thus, an investigation into possible factors that might mitigate the effects of PTSS on academic achievement is warranted.

The objective of this study was to examine three self-regulatory mechanisms involved in psychological recovery that could provide some explanation as to why there are academic differences among students with PTSS, more specifically differences in attentional control, attentional control self-efficacy, and coping. Attentional control allows students to sustain attention on a specific task and inhibits other intrusive thoughts

from impacting cognition (Derryberry & Reed, 2002; Eysenck, Derakshan, Santos, & Calvo, 2007). Attentional control self-efficacy describes a student's evaluative beliefs about his or her ability to control attention (Bandura, 2006). Coping is a set of cognitive and behavioral reactions to stress that can have both positive (e.g., problem-focused) and/or negative (e.g., avoidance) effects for combating PTSS (Carver, Scheier, & Weintraub, 1989; Glass, Flory, Hankin, Kloos, & Turecki, 2007; Schnider, Elhai, & Gray, 2007). All three mechanisms, individually, have been shown to affect cognitive performance and academic motivation. Therefore, the purpose of this research project was to examine potential differences in attentional control, attentional control self-efficacy, and coping strategies among college students with PTSS with varying grade point averages (GPA; low, average, high). It was hypothesized that PTSS students with higher GPAs will perceive themselves as having better attentional control, be more confident in their abilities to control attention, and use more problem-focused coping strategies rather than avoidant coping strategies than students with lower GPAs. Conversely, PTSS students with at-risk GPAs will perceive themselves as having poorer attentional control, be less confident in their abilities to control attention, and use more avoidant coping strategies.

Literature Review

Situational challenges are a normal part of college life; however, more and more college students are experiencing traumatic or adverse life challenges which can negatively impact cognitive function, social interactions, and academic achievement (McLean, Rosenbach, Capaldi, & Foa, 2013). For example, among a large, diverse college sample (*n* = 914), 56-85% of college students have experienced at least one adverse life event (Smyth, Hockemeyer, Heron, Wonderlich, & Pennebaker, 2008). Such events include death of a loved one, divorce or separation of parents, traumatic sexual experience, traumatic violent experience, or other events that may not be specified (Smyth et al., 2008). The *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (*DSM-5;* APA, 2013) indicates that an individual might develop symptoms of Posttraumatic Stress Disorder (PTSD) if they: (a) directly experience a traumatic event, (b) witness a traumatic event occurring to others, (c) learning of a traumatic event experienced by a close family member or friend, or (d) experience repeated or extreme exposure to aversive events. Thus, among the students in the Smyth et al. (2008) study, 11% showed similar symptoms to those diagnosed with PTSD.

Similarly, Bernat et al. (1998) found that 67% of college students (*n* = 937) have experienced at least one traumatic event. These events included natural disaster, serious accident, witness serious injury or death, sexual coercion, physical assault, serious personal illness, and military/combat experience as some of the traumatic events that college students have experienced (Bernat et al., 1998). Among the students who had experienced a traumatic event in this study, 12% endorsed having symptoms relating to a diagnosis of PTSD (Bernat et al., 1998). Together this research suggests that the high

prevalence of college students who have experienced a traumatic or aversive event and the significance of those who develop PTSS indicate further investigation into the impact these experiences may have on students.

Developing PTSS following an aversive or traumatic event can negatively impact a student's ability to be academically successful. Students who develop PTSS may endure symptoms such as intrusion or re-experiencing the traumatic event, avoiding trauma-associated stimuli, negative alterations in cognitions and mood, and alterations in arousal and reactivity following the traumatic event (APA, 2013). These negative cognitions can lead to impairment of cognitive functioning. Previous research has indicated that exposure to conditioned-fear stimuli related to times of actual threat can damage the hippocampus (McEwen, Gould, & Sakai, 1992; Sapolsky, Uno, Rebert, & Finch, 1990; Wooley, Gould, & McEwen, 1990). Specifically, glucocorticoids are released during stress, acting through the hippocampus, leading to a decrease in hippocampal volume (Bremner, Elzinga, Schmahl, & Vermetten, 2008). Elevations of glucocorticoids in the hippocampus and a decrease in hippocampal volume can impair memory functioning (Bremner et al., 2008). Deficits in memory functioning can impact the retrieval stage of processing (Hannay & Levin, 1985 as cited in Buckley, Blanchard, & Neill, 2000).

In addition to changes in the hippocampus, those who have experienced traumatic events may also have changes in the prefrontal cortex (Carrion, Wong, & Kletter, 2013). The prefrontal cortex is associated with executive functioning and the ability to suppress and filter information and actions in order to shift attention to relevant information (Carrion et al., 2013). Students with PTSS may have difficulties suppressing intrusive

memories associated with the trauma such as flashbacks or nightmares that could impact their abilities to shift attention in the classroom (Carrion et al., 2013).

Students with PTSS might also experience a reduction in cerebellar volume, which has an effect on the regulation of emotion and attention (Carrion et al., 2013). In fact, a decrease in cerebellar volume may represent a risk factor for students with PTSS by inhibiting cognitive resources that are used to adaptively process a traumatic event (Carrion et al., 2013). Cheng et al. (2015) looked at neuroanatomical differences between patients with PTSS (n = 30) to individuals with obsessive-compulsive disorder (OCD; n = 29), social anxiety disorder (SAD; n = 20), and a healthy control group (n = 30). The patients with PTSS excluded individuals with head trauma or other DSM-IV diagnoses. Results indicated that the PTSS group of patients exhibited gray matter volume differences compared to the control, OCD, and SAD groups. Specifically, the PTSS patients displayed reduced gray matter volume in the left cerebellum posterior lobe, which impacts attentional control and is associated with auditory-verbal memory functions (Cheng et al., 2015). Furthermore, students experiencing PTSS with a diagnosis of PTSD (n = 14) were found to have greater impulsivity, distractibility, and errors of sustained attention due to changes in the cerebellum than healthy comparison students who did not report PTSS (n = 15) (Beers & De Bellis, 2002).

In addition to changes in the cerebellum, individuals with PTSS experience further deficits in their cognitive abilities. For example, Rubin et al. (2016) completed a study to determine whether PTSS is associated with deficits in verbal learning, memory, and processing speed among women with or who are at-risk for contracting human immunodeficiency virus (HIV). Results indicated that regardless of HIV status, women

with PTSS who met diagnostic criteria for PTSD was significantly and inversely associated with cognitive performance. Women with PTSS (n = 253) performed worse on measures of verbal learning (d = .22), memory (d = .22), and psychomotor speed (d = .29) compared to women who did not meet diagnostic criteria (n = 1247).

PTSS are also associated with decreased concentration, interruptions of the process of learning, intrusive thoughts, fears of traveling to school (increased absences), difficulties falling and staying asleep (fatigue), increased levels of impulsivity and anger, conflict with peers (suspension), and school absences (Mathews, Dempsey, & Overstreet, 2009). The changes in cognitive functioning and other symptoms associated with PTSS may contribute to students having poor performance on schoolwork and tests (Mathews et al., 2009).

Attention, memory, and executive functioning are all key components to learning. Learning takes place when a student is able to acquire new skills and abilities (Commodari, 2012). In order to acquire skills and abilities, students must be able to focus on selected material while inhibiting non-pertinent information (Commodari, 2012). Attention is involved in the selection of information, integration of the selected information, and programming of motor and behavioral responses (Commodari, 2012). A student's ability to sustain attention on selected material is key to developing new skills and abilities. Difficulties in attention arise when a student is unable to control incoming stimuli, which has been linked to further impairments in executive functioning (Commodari, 2012).

Executive functioning is a collection of core components such as inhibition, working memory, planning, and problem solving (Rhodes et al., 2014). It is described as

the control mechanisms that coordinate, regulate, and control cognitive processes during cognitive tasks (Desoete & De Weerdt, 2013). Executive functioning allows a student to maintain interference control. Interference control is the ability to sustain performance and suppress competing or distracting stimuli (Desoete & De Weerdt, 2013). For learning to take place, students must be able to inhibit intrusive thoughts and stimuli in order to maintain attention on a task and convert new information into working memory.

Working memory is considered a temporary holding place that manipulates knowledge into active consciousness until the information has been properly encoded and stored in long-term memory for future retrieval or use (Schweppe & Rummer, 2014). Working memory has a limited capacity for holding and learning new information and performing a learning task increases cognitive load (Darabia & Jin, 2013). For learning to take place, the working memory cannot be overloaded during information processing (Schweppe & Rummer, 2014). Since learning requires active processing in attention, executive functioning, and memory, impairments in these areas can negatively impact the ability to learn new information. Students who have increased stress or anxiety, such as those with PTSS, use additional attentional resources related to the stress which decreases the capacity of cognitive load and impairs those students' abilities to process new information (Darabia & Jin, 2013).

For example, Li et al. (2013) examined poly-victimized junior college students with PTSS in China on measures of executive function using the Behavior Rating Inventory of Executive Function – Adult Version (BRIEF-A). These students reported previously experiencing conventional crime, child maltreatment, peer and sibling victimization, sexual victimization, and/or witnessing and indirect victimization. Students

who indicated PTSS, as measured on the Posttraumatic Stress Disorder Checklist – Civilian Version, (n = 59) demonstrated significantly elevated scores on seven of the BRIEF-A scales including Inhibit, Shift, Emotional Control, Initiate, Working Memory, Plan/Organize, and Organization of Materials compared to the non-victimization group (n = 80). Elevated scores indicated a greater difficulty and level of impairment of executive functioning. The BRIEF-A yields an overall Global Executive Composite (GEC), which combines the Behavioral Regulation Index (Inhibit, Shift, Emotional Control, and Self-Monitor) and the Metacognitive Index (Initiate, Working Memory, Plan/Organize, Task Monitor, and Organization of Materials). This suggests that students who have been previously victimized experience deficits in executive functioning during college. Deficits in these areas can impair students' abilities to inhibit intrusive thoughts, shift attention, and maintain emotional control in the college classroom. Thus, students with PTSS are likely to display deficits in cognitive abilities such as attention, memory, and executive functioning, and it is presumed that those deficits greatly impact their academic performance in the classroom.

However, there is additional research examining the impact posttraumatic stress has on academic functioning with discrepant results from the research previously discussed. Bryan, Bryan, Hinkson, Bichrest, and Ahern (2014) examined relationships among self-reported PTSS, depression symptoms, and grade point average (GPA) among student service members and veterans (n = 276) at the college level. Participants included 422 service members and veterans ranging in age from 19 to 78 years old (M = 36.29; SD = 10.25). The majority of the participants were male (71.9%) and were no longer in the military service (64.9%) who represented all branches of service. Of the 422 participants,

146 students were in their first academic term and did not have a reported GPA. Therefore, 276 participants were included in the study to compare PTSS with GPA. The study hypothesized that self-reported PTSS and depression symptoms would be associated with lower GPA and more academic problems such as turning in an assignment late, receiving a low grade on an exam, failing an exam, and skipping class. The study found that the mean reported GPA (3.45) suggested good academic performance among the participants. Furthermore, PTSS were not associated with lower GPA, whereas depression, male sex, and younger age were significantly correlated with lower GPA. Those students with reported PTSS and depression had the lowest GPA where the groups of students with PTSS only, depression only, or neither PTSS nor depression had comparable GPAs (Bryan et al., 2014). Overall, these findings are inconsistent with previous research that indicated students with PTSS had more academic difficulties.

Similarly, Kolts, Lombardo, and Faulkner (2004) tested the effects of a trauma-memory cue (trauma-cue vs. neutral-cue) manipulation on college students' (PTSS; n = 39 vs. No PTSS; n = 44) verbal memory, short-term memory, and attention. Results of the study indicated that college students with PTSS – regardless of condition (trauma-cue vs. neutral cue) -- did not experience significant deficits on scores of verbal memory, serial list learning, visual memory, or attention, which suggests students with PTSS do not always demonstrate deficits in these areas (Kolts et al., 2004). It is evident that there are contradictory findings in research regarding students with PTSS and their abilities to function in the classroom and these students may not display certain cognitive deficits that would be expected.

Research has indicated that a large percentage of students have experienced a traumatic event and many of these students develop PTSS. Students who develop PTSS often experience cognitive impairments, which may impact their school functioning. However, there have been inconsistencies among research for these students. Collectively, these findings suggest that some students with PTSS still perform well in school and other academic endeavors despite possible cognitive impairments related to the trauma. Further investigation into the differences among college students is warranted based on the discrepant findings in the research.

PTSS and Attentional Control

Students with PTSS often experience impairments related to sustaining attention on specific tasks. Research has indicated that anxiety impairs attentional control (i.e., the ability to focus and shift attention) and increases attention to threat-related stimuli (Eysenck et al., 2007). Sippel and Marshall (2013) found that PTSS severity positively correlated with fear of emotions and negatively correlated with attentional control among the 47 participants who met criteria for PTSD. This finding indicates that those with trauma-related anxiety and diagnosed PTSD have impairments in controlling their attention to the tasks at hand. Differences in attentional control may play a role in a student's ability to focus and shift attention in the classroom and may impact his/her academic achievement.

PTSS and Self-efficacy for Attentional Control

Many studies have looked at how a person's beliefs about dealing with posttraumatic adversities can impact life outcomes for that individual (Alt, 2015; Benight & Bandura, 2004; Luszczynska et al., 2009). One specific type of belief that might

explain whether or not a person afflicted with PTSS might overcome the negative effects of the symptoms during learning would be self-efficacy. Self-efficacy is described as a person's beliefs about their capabilities and is dependent on the task at hand (Bandura, 1993). Self-efficacy develops through mastery experiences, vicarious experiences, social persuasion, and/or somatic and emotional states (Bandura, 1994). When students experience success (mastery experiences) or see others who are similar to them experience success (vicarious experiences), they build a strong belief in their abilities to show success in similar situations. Students who are persuaded that they possess abilities to complete a task also demonstrate a stronger sense of self-efficacy. Furthermore, some students interpret their stress reactions in relation to their abilities, which may also impact their beliefs about their performance (Bandura, 1994).

Self-efficacy is important to study because it plays an important role in the management of self-regulatory behaviors and affects the degree to which individuals put forth effort and persist during challenging tasks or task conditions (Bandura, 1994). Research suggests that self-efficacy is a positive predictor of cognitive task performance (e.g., Bandura, 1993; Berry & West, 1993), and "is associated with enhanced attentional control during task execution" (Themanson & Rosen, 2015, p. 266). In schools, academic self-efficacy is a strong predictor of academic performance (e.g., Alt, 2015; Galla et al., 2014; Galyon, Blondin, Yaw, Nalls, & Williams, 2012; MacPhee, Farro, & Canetto, 2013) as well as, academic resilience (Cassidy, 2015).

Recognizing that self-efficacy and attentional control are important factors in academic success and resilience, a student's beliefs about their abilities to control attention during school work (academic attentional control self-efficacy) might provide

additional information about how students with PTSS may react in an educational setting and thus, be a predictor of posttraumatic recovery (Luszczynska et al., 2009). Unfortunately, there are no measures available that specifically measure academic attentional control self-efficacy. The lack of a self-efficacy measure is not uncommon in psychological research because of the task-specific nature of the construct (Bandura, 2006). In fact, measures of self-efficacy must be "tailored to the particular domain of functioning that is the objective of interest" (Bandura, 2006, p. 308) in order to have explanatory and predictive capabilities. Thus, the formation of an academic attentional control self-efficacy scale following established guidelines by Bandura (2006) will assist in gaining that understanding and is an industry standard. The guidelines indicate that items must reflect the construct; items must reflect one's perceived capability phrased as "can do" rather than "will do;" items must include gradation of challenges to successful performance, and include a response scale in which participants rate their strength of belief in their ability to execute the required activities.

PTSS and Coping

Following a traumatic event, many people go through a process of dealing with their emotions and cognitions to adapt to the changes they encounter. Coping is defined as a person's constantly changing cognitive and behavioral efforts to manage specific demands (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986). Researchers have looked into different coping strategies relating to psychological distress following a traumatic event. Problem-focused or adaptive coping and emotion-focused or avoidance coping strategies are the two main domains of dealing with traumatic events (Glass et al., 2007). Problem-focused coping involves actively planning or engaging in specific

behaviors in order to overcome the stressor (Schnider, Elhai, & Gray, 2007). Individuals who use more problem-focused coping often emphasize the positive aspects of stressful situations, such as actively confronting difficult situations, making plans to address stressful features of life, and focusing on positive aspects of the situation (Tiet et al., 2006). Emotion-focused or avoidant coping involves regulating one's emotions to avoid the source of distress (Schnider et al., 2007). This often includes behaviors such as not thinking about the problem, using emotional discharge (e.g., crying, shouting) to vent, and relying on wishful thinking (Tiet et al., 2006). Avoidant coping strategies have been found to be positively associated with PTSS and general distress following a traumatic event, which indicates that individuals who use avoidant coping strategies may be more likely to develop PTSS (Glass et al., 2007).

Schnider et al. (2007) completed a study among 123 students who reported an unexpected loss and enrolled in college courses. The participants completed a demographics survey, the Stressful Life Events Questionnaire-Modified, the Inventory of Complicated Grief-Revised-Short Form, the Brief COPE, and the PTSD Checklist. Correlational analysis found that college students with PTSS most strongly associated with using avoidant emotional coping for dealing with the traumatic loss (r = .81). Moreover, only avoidant emotional coping was as a significant and substantial predictor of chronic grief and PTSS severity. Similarly, Gil (2005) found that using an avoidant coping style was a significant predictor of PTSS (β = .31) following a traumatic event among college students (n = 81) and students who developed PTSS also reported significantly lower levels of problem-focused coping (β = -.29). These findings may suggest that students who have experienced a traumatic event or have PTSS use more

maladaptive coping strategies, which can impair academic performance at the collegiate level. Therefore, it may be expected that students with PTSS displaying academic difficulties are using more emotion-focused or avoidant coping strategies and less problem-focused coping strategies for managing their symptoms.

Attentional control, attentional control self-efficacy, and coping are all self-regulatory mechanisms involved in psychological recovery following a traumatic event. Differences in these mechanisms among students could provide some information as to why students with PTSS may perform differently within their academic endeavors. Little research has been conducted that investigates differences in these areas among university students dealing with PTSS. The present study aims to evaluate the potential differences in attentional control, attentional control self-efficacy, and coping strategies among college students who have symptomology similar to those diagnosed with posttraumatic stress disorder. Specifically, the guiding research questions are:

1. Do college students with posttraumatic stress symptomology (PTSS) holding a high GPA differ in their self-reported attentional control from PTSS students with an average or low GPA?
    - Hypothesis: Students who have PTSS with a high GPA will perceive themselves as having better attentional control compared to PTSS students with an average or low GPA.
2. Do college students with PTSS holding a high GPA differ in their self-reported academic attentional control self-efficacy from PTSS students with an average or low GPA?

- Hypothesis: Students who have PTSS with a high GPA will perceive themselves as being more confident in their abilities to control attention compared to PTSS students with an average or low GPA.

3. Do college students with PTSS holding a high GPA differ in their self-reported problem-solving coping and avoidant coping from PTSS students with an average or low GPA?
    - Hypothesis: Students who have PTSS with a high GPA will use more problem-solving coping strategies and less avoidant coping strategies compared to PTSS students with an average or low GPA.

Methodology

Participants

College students (N = 201) from one large comprehensive university were recruited to participate in a larger study. Since the current study was focusing on college students who had posttraumatic stress symptomology, a total of 58 participants aged 18 to 33 years (M = 21.4, SD = 2.94) met the criteria (i.e., had experienced at least one traumatic event measured by the Trauma Stress Schedule; TSS, Norris, 1990), and experienced – at minimum – some degree of intrusive thoughts, hyperarousal, *and* avoidance after the traumatic event measured by the Impact of Event Scale – Revised; IES-R, Weiss & Marmar, 1997). The sample included 23 freshmen, 18 sophomores, 9 juniors, and 8 seniors. Three groups were created based on college GPA (4-point scale) and graduation requirements at the university: the low GPA group (range 0.00-2.49) is "At-Risk" for graduating, the average GPA group (range 2.50-3.39) is "On-Track" for graduating, and the high GPA group (range 3.40-4.00) is progressing towards graduating with an "Honors" distinction. The number of students within each group is shown in Table 1. The type and prevalence of trauma that the sample experienced is shown in Table 2.

Table 1

Participants (n) by College GPA

	Honors (High) (3.40-4.00) *n* = 12 (20.7%)	On-Track (Average) (2.50-3.39) *n* =22 (37.9%)	At-Risk (Low) (0-2.49) *n* = 24 (41.4%)	Total
Gender				
Female	9	10	13	32 (55.2%)
Male	3	12	11	26 (44.8%)
Race/Ethnicity				
Asian	1	3	3	7 (12.1%)
Black/African American	0	3	7	10 (17.9%)
White	11	12	11	34 (58.6%)
Hispanic	0	1	2	3 (5.2%)
Other/Unknown	0	3	1	4 (6.8%)

Table 2

Types/Prevalence of Trauma

	Honors (3.40-4.0) *n* = 12 (20.7%)	On-Track (2.50-3.39) *n* = 22 (37.9%)	At-Risk (0-2.49) *n* = 24 (41.4%)	Total
Violent robbery	1	5	5	11 (19.0%)
Physical assault	4	9	11	24 (41.4%)
Unwanted sexual activity	2	9	5	16 (27.6%)
Death of loved one	8	11	13	32 (55.2%)
Injury/damage from fire	0	0	1	1 (1.7%)
Natural disaster	2	1	0	3 (5.2%)
Motor vehicle accident	3	3	5	11 (19.0%)
Witness to injury/death	2	7	11	20 (34.5%)
Physical injury from accident	0	3	3	6 (10.3%)
Unspecified event	1	3	7	11 (19.0%)

Note. Students may have experienced more than one traumatic event.

Measures

Participants completed a survey that included demographics and measures of types of trauma (Trauma Stress Schedule; Norris, 1990), posttraumatic stress symptoms (IES-R; Weiss & Marmar, 1997), attentional control (Attentional Control Scale; Derryberry & Reed, 2002), self-efficacy (Self-Efficacy for Attentional Control; created for the current study based on Bandura's 2006 guidelines) and coping (Brief COPE; Carver, 1997).

Developed by Norris (1990), the Trauma Stress Schedule (TSS) consists of ten items about potentially traumatic events that people may experience in their lifetime. Such events included violent robbery, physical assault, motor vehicle accident, natural disaster, death of a loved one, witness to injury/death, unwanted sexual activity, injury/damage from fire, other accident resulting in injury, and other unspecified events. Participants indicated whether they experienced the event, how often, and at what age. The TSS was used to understand the types of traumatic events the participants experienced and to identify which participants should be evaluated on their posttraumatic stress symptom severity using the Impact of Events Scale-Revised (IES-R; Weiss & Marmar, 1997).

The IES-R (Weiss & Marmar, 1997) is a 22-item scale that was used to evaluate the degree to which trauma-exposed participants experienced distress during their traumatic event. The IES-R reports a continuum of PTSD symptoms and is used for diagnosis of PTSS. The items correspond directly to 14 of the 17 DSM-IV symptoms of PTSD and form three subscales: intrusion (8 items), avoidance (8 items), and hyperarousal (6 items). The three subscales show a high degree of intercorrelation (*rs* = .52 to .87) and each item is assessed using a 5-point Likert scale ranging from 0 (not at all) to 4 (extremely). Weiss and Marmar (1997) reported the Intrusion subscale yielded a coefficient alpha of .87-.94, the Hyperarousal subscale yielded a coefficient alpha of .79 - .91, and the Avoidance subscale yielded a coefficient alpha of .84 - .87. Test-retest reliability ranged from .89 to .94 (Weiss & Marmar, 1997). Within the current study, high levels of internal consistency were reported on the Intrusion subscale (α = .90),

Hyperarousal subscale (α = .83), and Avoidance subscale (α = .87). To determine clinical significance of PTSS, scores on each of the intrusion, avoidance, and hyperarousal subscales must be greater than one to meet criteria for PTSS.

The Attentional Control Scale (ACS) was developed by Derryberry and Reed (2002) as a self-report measure of one's ability to focus perceptual attention, switch attention between tasks, and flexibly control thoughts. The ACS has 20 items, of which eleven are reversed, and responses are rated on a 1 (almost never) to 4 (always) Likert scale. Higher scores indicate better attentional control abilities. Derryberry and Reed (2002) reported high levels of internal consistency yielding a coefficient alpha of .84. Similar results were found within German (α = .83) and Iranian (α = .84) studies using the ACS (Moradi, Fata, Abhari, & Abbasi, 2014; Schãfer et al., 2015), as well as in the current study (α = .81).

The Academic Attentional Control Self-Efficacy (AACSE) scale was created specifically for the larger study and followed Bandura's (2006) guide for constructing self-efficacy scales (e.g., accurately reflecting the construct, been written for what a person *can do* rather than *will do*, have varying levels of task demands that represent variation in challenges or barriers to successful performance). The scale consists of seven items and responses are rated on a 1 (not very well) to 6 (very well) Likert scale (see Appendix). Items ask participants to rate how well they are able to focus, shift, and alter their attention during specific tasks -- the constructs measured in the Attentional Control Scale (Derryberry & Reed, 2002). Mean scale scores indicate a person's relative perception of their attentional control capabilities. To provide validity evidence for the measure, the seven items of the AACSE for the larger study's sample (N = 201) were

subjected to an exploratory factor analysis (EFA) using IBM SPSS version 23 software and revealed one component explaining 48.34% of the variance (loadings: .639-.741). Results from a Parallel Analysis confirmed this one-factor solution for randomly generated data. In addition, convergent validity was assessed by examining the correlations among the items resulting in a Cronbach's alpha level of 0.87. Together this evidence supports the use of the instrument in subsequent analyses as a measure of the construct -- i.e., academic attentional control self-efficacy (Thompson, 2004).

Developed by Carver (1997), the Brief COPE is an instrument for assessing general coping strategies in stressful situations. It is derived from the Coping Orientation to Problems Experienced inventory (COPE; Carver et al., 1989). The Brief COPE is a short, multidimensional inventory that consists of 28 items from which 14 conceptually differentiable coping reactions can be obtained (Carver, 1997). Participants are asked to respond on a 1 (I haven't been doing this at all) to 4 (I've been doing this a lot) Likert scale with no reversal items. The 14 subscales include self-distraction, active coping, denial, substance use, use of emotional support, use of instrumental support, behavioral disengagement, venting, positive reframing, planning, humor, acceptance, religion, and self-blame. In this study, the 14 subscales were combined using criteria outlined by prior research (Gilbar, Plivazky, & Gil, 2010; Hruska, Sledjeski, Fallon, Spoonster, & Delahanty, 2011) to form two coping constructs: problem-focused coping (α=.87) and avoidant coping (α=.82). Previous research (Glass et al., 2007) yielded a Cronbach's alpha to be .81 for problem-focused coping and .73 for avoidant coping using the Brief COPE. Problem-focused coping includes the following subscales: active coping, use of emotional support, use of instrumental support, venting, positive reframing, planning,

humor, acceptance, and religion. Avoidant coping includes the subscales of self-distraction, denial, substance use, behavioral disengagement, and self-blame comprise the avoidant coping subscales.

Procedure

As part of the larger study, which occurred from the fall 2012 semester to the spring 2014 semester, participants completed the TSS, IES-R, ACS, AACSE, Brief COPE, and demographic measures. Once data collection was completed, information from participants who met PTSS criteria was extracted from the larger data file to be used in this study. Three groups of interest were determined based on GPA ranges and university criteria for graduation. Participants with GPA's ranging from 3.40-4.0 are on track for graduating with Honors from the university. Participants with GPA's ranging from 2.49-3.39 are on track for graduating from the university. Participants with GPA's falling below 2.49 are at-risk for graduating from the university. To determine if statistical significance exists between the three groups (i.e., Honors, On-Track, and At-Risk) on attentional control, attentional control self-efficacy, and coping (problem-focused and avoidant), a one-way between-groups analysis of variance (ANOVA) with Scheffe post hoc tests were conducted due to unequal sample sizes among the three groups. To provide a standardized measure of an effect, eta squared analyses were conducted, which indicates the proportion of variance on the variables (Sun, Pan, & Wang, 2010; Tabachnick & Fidell, 2013). To interpret the strength of the effect sizes detected in this study, guidelines proposed by Ferguson (2009) were used: small = .04, medium = .25, and large = .64 while evaluating the effects in the context of the study and supporting literature (Trusty, Thompson, & Petrocelli, 2004).

Results

Descriptive and inferential statistics for this study are reported in Table 3. A one-way between groups analysis of variance (ANOVA) was conducted to explore the impact of GPA on levels of attentional control, attentional control self-efficacy, problem-focused coping, and avoidant coping among the three groups (Honors, On-Track, and At-Risk). There was a statistically significant difference at the $p < .05$ level in attentional control self-efficacy (F (2, 55) = .71, p =.043, η^2 =.11) and avoidant coping (F (2, 55) = .14, p =.03, η^2 =.12). Post-hoc comparisons using the Scheffe test indicated that the mean score for attentional control self-efficacy for the Honors group (M = 3.61, SD = .92) was marginally different from the At-Risk group (M = 2.85, SD = .95). The mean score for avoidant coping for the Honors group (M = 1.88, SD = .32) was significantly different from the At-Risk group (M = 2.33, SD = .45). The On-Track group (M = 2.26, SD = .55) differed marginally from the Honors group for avoidant coping. There were not significant differences between the On-Track group and the other two groups for attentional control self-efficacy.

Table 3

Descriptive and Inferential Statistics for Self-Regulatory Variables

		Honors (n = 12)	On-Track (n = 22)	At-Risk (n = 24)		
	Range	Mean (*SD*)	Mean (*SD*)	Mean (*SD*)	*F*	η
Attentional Control	1.0-4.0	2.68 (0.45)	2.50 (0.35)	2.45 (0.34)	1.59	--
AC Self-Efficacy	1.0-6.0	3.61_{a} (0.92)	3.31_{ab} (0.78)	2.85_{b} (0.95)	3.35*	0.11
Problem-Focused Coping	1.0-4.0	2.56 (0.45)	2.29 (0.48)	2.38 (0.50)	1.23	--
Avoidant Coping	1.0-4.0	1.88_{a} (0.31)	2.26_{b} (0.55)	2.33_{b} (0.45)	3.78*	0.12

Note. AC = Attentional Control. Means in the same row that do not share subscripts differ at the $p < .05$ level. *F* statistics marked with an asterisk (*) are significant at the $p < .05$ level. η^2 indicates effect size.

Discussion

The focus of the present study was to examine three self-regulatory mechanisms involved in psychological recovery that could provide some information as to why there are academic differences among students with PTSS. The first aim of this study was to assess the difference in self-reported attentional control from PTSS students with varying grade point averages. It was hypothesized that students holding a high GPA would report better attentional control than students with an average or low GPA. Results indicated the groups did not differ significantly in regards to controlling attention. A closer examination of the mean-level scores for attentional control (range: 2.45-2.64) indicate that participants reported being able to control their attention more often than not when facing tasks that required attentional focus, switching, or flexibility. This differs from previous research that has indicated students with PTSS experience impairments in attention and attention control (Beers & De Bellis, 2002; Eysenck et al., 2007; Carrion et al., 2013; Darabia & Jin, 2013).

Attentional control theory has indicated that anxious students often allocate attentional resources to threat-related stimuli that decrease their ability to focus attention on the current task (Eysenck, 2007). Similar findings were found by Sippel and Marshall (2013), who reported that students with PTSS may have impairments in attentional control and in turn inhibitions with emotional regulation. In the current study, each participant displayed PTSS, which would suggest they are using attentional resources in relation to the threat-related stimuli, yet reported average abilities for attentional control. Wisco, Pineles, Shipherd, and Marx (2013) looked at the relationship between attentional interference and PTSS and found that allocating attention to the threat-related stimuli was

not always problematic; rather, thought suppression and worry better accounted for the relationship between attentional interference and PTSS.

In the current study, participants reported being able to focus perceptual attention, switch attention between tasks, and flexibly control thoughts relatively well on a day-to-day basis. The level of PTSS severity could impact how intrusive the traumatic thoughts may be and if it affects the participants in all situations. Looking at the differences among students with PTSS versus students who met diagnostic criteria for PTSD within the sample may provide further explanation into the differences. For example, among the 58 participants with PTSS, 11 met diagnostic criteria for PTSD, which indicates that their symptoms of intrusion, avoidance, and hyperarousal are more severe. Previous research often looks at individuals who displayed PTSS and meet diagnostic criteria; therefore, attentional control among the sample of individuals with PTSS may not be as impacted as samples that looked at individuals with PTSD (Sippel & Marshall, 2013; Vasterling et al., 2002). However, understanding how students are controlling attention and what specific attentional control strategies they are using may better explain potential academic differences among the participants in the sample.

The second aim of this study was to assess differences of self-reported academic attentional control self-efficacy between the groups. It was hypothesized that students holding a high GPA would report perceiving themselves as being more confident in their abilities to control attention compared to the On-Track and At-Risk groups. Students within the Honors group indicated that they were significantly more confident in their abilities to control attention compared to the At-Risk group When looking at the mean-level scores for academic attentional control self-efficacy (range: 2.85-3.61), participants'

scores for all three groups were near the scale mid-point indicating that none of the participants were overly confident in their abilities to focus, shift, and alter their attention during specific classroom tasks. The relatively small effect size would support this finding of little practical significance in the statistical differences. However, participants within the Honors group felt that they could focus, shift, and alter attention moderately well during school work compared to the At-Risk group who was less efficacious.

When looking at studies that have assessed academic self-efficacy, this finding is similar to previous studies that have found students report mean-level scores around the scale midpoints and those that reported higher academic performance also report higher levels of academic self-efficacy (Cassidy, 2015; Putwain, Sander, & Larkin, 2013). As previously stated, academic self-efficacy is a strong predictor of academic performance and cognitive task performance, which includes attentional control. Students' abilities to focus attention on the content in the classroom and eliminate intruding thoughts helps improve academic success (Franklin, Smallwood, Zedelius, Broadway, & Schooler, 2015). Furthermore, students' beliefs about controlling attention during school work (i.e., academic attentional control self-efficacy) contribute toward academic development (Cassidy, 2015). Increased self-efficacy beliefs are associated with increased motivation and perseverance, which translates to academic success in the classroom. Specifically, previous research has reported that self-efficacy is an important contributory factor to academic resilience, which is described as an increased likelihood of academic success despite environmental adversities (Cassidy, 2015). In the current study, the students are working towards college degrees – i.e., experiencing academic resilience -- even after experiencing a traumatic event and demonstrating PTSS. Acknowledging the additional

challenges for those students who are academically at-risk (e.g., struggling in college, lower academic attentional control self-efficacy), perhaps the collective group's academic success could potentially be explained by the development of somewhat effective attentional control and attentional control self-efficacy beliefs. Further investigation of this phenomenon is warranted using experimental procedures to determine this causal link.

Lastly, the study aimed to assess the differences between groups in using problem-solving and avoidant coping strategies. It was hypothesized that students in the Honors group would use more problem-solving (adaptive) coping strategies and less avoidant (maladaptive) coping strategies compared to the On-Track and At-Risk groups. For adaptive coping, there were no significant differences amongst the three groups of participants for use of problem-solving coping strategies. In fact, among the three groups, the mean-level scores for problem-focused coping (range: 2.29-2.56) indicate that all participants have been using adaptive coping strategies somewhat frequently. Adaptive coping strategies have been found to positively correspond with posttraumatic growth and the potential for positive changes following a traumatic event (Kirby, Shakespeare-Finch, & Palk, 2011). Research has found that individuals with PTSS and their abilities to use adaptive coping strategies have been associated with resilience among those individuals (Ness, Rocke, Harrist, & Vroman, 2014). Adaptive coping strategies contribute to academic success among resilient individuals in their abilities to adjust to a difficult situation in order to create more positive learning environments, such as moving away from distractions to create a quieter location to study (Ness et al., 2014). Participants in the current study have indicated that they use problem-solving coping

strategies relatively frequently to overcome some of the symptoms they may be experiencing relating to PTSS. The use of these adaptive coping strategies could be helping them in their college courses to regulate their cognitions, emotions, and behaviors, thus contributing to their academic resilience and on-going success towards graduation. Understanding what specific adaptive coping skills students possess in given situations and enhancing those strategies may be beneficial for students with PTSS.

Regarding the use of maladaptive coping strategies, the results indicated that the Honors group reported using the avoidant coping strategies on a very limited basis, while the On-Track and At-Risk groups use the avoidant strategies more frequently. However, the mean-level scores for avoidant coping (range: 1.88-2.33) and the effect size would suggest that although there were statistically significant differences between the groups, the practical significance of the findings are relatively weak. Thus, all students in the study report the use of maladaptive coping strategies to manage their PTSS, albeit relatively infrequently. In academics, students who are unable to efficiently cope with PTSS may be at a greater risk for displaying difficulties for concentrating in school and establishing greater academic strategies to be successful (Glass et al., 2007; Lazarus & Folkman, 1984; Solomon, Mikulincer, & Flum, 1988; Blake, Cook, & Keane, 1992 as cited in Amir et al., 1997). For example, students who use more maladaptive coping strategies often allocate attentional resources to suppress intrusive thoughts and are unable to focus on academic material (Amir et al, 1997). These students may also socially withdraw from class discussion and become angry with others as an emotional release, which impacts their learning environments (Ness et al., 2014). Previous research has found that students who reported higher levels of stress, anxiety, and depression, similar

to those with PTSS, were considered to be low resilient students (Cassidy, 2015). Promoting academic resilience for these students to limit negative behavior by focusing on problem-solving skills, motivation and goal orientation, and creating positive learning environments may address the gap in achievement between students (Cassidy, 2015).

The students in the current study – especially those who are considered At-Risk -- use maladaptive coping strategies at times to manage their emotions; however, these strategies may not be as academically impairing as hypothesized considering that the students in the sample are in fact, in college and working towards professional degrees. One possible explanation for their academic resilience could be that the participants may be using these maladaptive strategies for situations outside of the classroom, which may not impact how they perform on tasks within the learning environment. Another possible explanation could be that because these students also reported that they use a variety of adaptive coping strategies that the problem-solving coping strategies might be more accessible or preferred when faced with challenges in an academic setting and thus contribute to their academic success. Understanding when and how they use both their adaptive and maladaptive coping strategies would provide further explanation into academic differences within the current sample.

Conclusion and Implications

Together these findings suggest that students with PTSS are displaying success at the collegiate level, despite previous research. Among the participants in the current study, the majority are on track to complete their undergraduate degree. This suggests that they have, to some extent, the ability to control their attention during demanding tasks, are somewhat confident in their abilities to control attention during school, and

have the capabilities to use adaptive coping strategies more frequently than maladaptive ones. Hence, it would seem that attentional control, academic attentional control self-efficacy, and coping may play a role in the degree to which students with PTSS are successful in school, their psychological recovery following a traumatic event, and their academic resilience in school.

Understanding the skills necessary for academic success and the challenges that students with PTSS face is beneficial for school/college personnel. Professionals can develop strategies and supports for these students to address potential weaknesses – specifically within areas of attentional control, academic attentional control self-efficacy, and adaptive coping, rather than maladaptive coping. Researchers have investigated specific interventions that target these self-regulatory mechanisms. For example, Bernstein and Zvielli (2014) created an awareness training program for attentional allocation and found that receiving feedback regarding participants' attentional biases (i.e., preferred attentional allocation) led to reduced attention to threat-related stimuli, lower rate of behavioral avoidance of a stressor, and a faster rate of recovery following a stressor. Self-efficacy research from Bandura (1994) indicates that when students experience success (mastery experiences), they begin to build a stronger belief system about their abilities. The theory also reveals that interpretations of stress reactions in relation to abilities can impact a student's beliefs. As students are able to control attention following interventions, they are gaining mastery experiences, and as they acquire success, students' interpretations of their abilities will adjust. Therefore, it is expected, that their academic attentional control self-efficacy will increase following interventions for attentional control. Specific interventions on mindfulness -- attention focused

meditative practices -- have been found to be effective on improving adaptive coping skills and help individuals better manage stressful events (Halland et al., 2015). Mindfulness training aids students in improving emotional awareness, redirecting their attention, and transforming stressful events into more manageable challenges. Additional research using resilience based interventions (e.g., cognitive-behavioral therapy, social support, and/or psychoeducation) for individuals with PTSS found decreases in symptomology, gains for controls in memory functions including encoding retention, and retrieval (Kent, Davis, Stark, & Stewart, 2011), greater resilience, and more effective coping strategies (Steinhardt & Dolbier, 2008). Overall, research indicates that developing and/or providing established interventions to address specific self-regulatory mechanisms related to psychological recovery (e.g., attentional control, academic attentional control self-efficacy, and coping) from PTSS should be beneficial to university students with weaknesses in those specific areas. By providing relevant resources (e.g., programs) to students to help them improve their skill should aid them in achieving greater academic success.

Limitations

The current study presents with several limitations, which may impact the significance of the findings. The first of these is sample size. A total of 58 participants who were students at one university in the Mid-south were included in the present research. With such a small sample from only one university, the groups may not be representative of the larger population of college students who experience PTSS. Furthermore, the participants were all students at the university level, thus, the findings would not generalize to school-age students who experience PTSS. Additionally, of the

58 participants that are included, 11 met diagnostic criteria for PTSD (APA, 2013), which means the majority of the students in the study had posttraumatic stress symptoms less severe than those individuals who have PTSD. Research indicates that individuals with PTSD experience multiple symptoms of negative alterations and arousal in addition to one or more symptoms of intrusion and avoidance. These symptoms impact those with PTSD in social, occupational, or other important areas of functioning (APA, 2013). Individuals with PTSS who do not meet diagnostic criteria may only experience one symptom in each category (intrusion, avoidance, negative alterations, and arousal) or experience symptoms in some areas, but not in all areas. Thus, the hypotheses -- which were generated from a review of the research on PTSD and PTSS -- may not have been supported by the data in the study due to the lack of symptom severity in the sample and in overgeneralizing the research on PTSS and PTSD. Finally, the study used self-report data in the analyses. There are known problems with self-report data as the participants may not fully understand the items or may not be fully accurate in their responses (Pike, 2011). Potential biases may exist due to the nature of recalling previously occurred events and the students' reactions to potentially traumatic experiences. Together these limitations should be taken into consideration when interpreting the findings.

Future Research

Given the results of the present study and the aforementioned limitations, future research examining aspects of post-traumatic stress and its relation and effects on academic functioning should include representative samples of students from a variety of academic levels, geographic locations, and symptom severity to increase generalizability of the results. For example, including a large representative sample of college students

from universities of varying Carnegie levels with equal numbers of individuals with PTSD and those with PTSS without a diagnosis would provide additional information about the impacts of posttraumatic stress on academic success at the postsecondary level. Additionally, future studies should include laboratory-based measures to gage attentional control, attentional control self-efficacy, and coping. For example, administering an in-depth interview or structured observations of students with posttraumatic stress may help eliminate biases associated with self-report data. Also, using eye-tracking tasks may provide a more objective measure of attentional control.

Furthermore, understanding the differences among students with PTSS is a stepping stone in developing strategies to overcome the stressors associated with PTSS. Students who are unable to maintain attention, have poor beliefs about their abilities, and use avoidant coping strategies need to learn methods for overcoming those obstacles so that they can be successful in post-secondary education. Additional research in methods for improving these mechanisms is warranted, as well as instruction in providing supplementary resources to these students.

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Appendix: Academic Attentional Control Self-Efficacy Scale

Academic Attentional Control Self-Efficacy

Please rate the following items based on how well each item describes your abilities. Your rating should be on a 6-point scale where **1= not very well at all** to **6=very well**.

1. How well can you focus attention on your school work when there are distractions?
2. How well can you block out distracting thoughts when you are supposed to be focusing your attention on your school work?
3. How well can you tune out background noises and concentrate on your school work?
4. How well can you easily shift your attention back to your school work when you are interrupted or distracted?
5. How well can you focus your attention on multiple things in the classroom at the same time?
6. How well can you alter your attention between two different learning tasks?
7. How well can you focus your attention on your school work when you are stressed or upset?